

# What Works Clearinghouse

## Brief Study Report

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**Reviewed Study:** Crawford, J., & Raia, F. (1986, February). *Analyses of eighth grade math texts and achievement* (evaluation report). Oklahoma City: Planning, Research, and Evaluation Department, Oklahoma City Public Schools.

WWC Study Reports are intended to support decision making; neither the What Works Clearinghouse (WWC) nor the U.S. Department of Education endorses any interventions. No single Study Report should be used as a basis for making policy decisions because (1) few studies are designed and implemented flawlessly and (2) all studies are tested on a limited number of participants, using a limited number of outcomes, at a limited number of times, so generalizing from one study to any context is very difficult. To highlight these issues, the WWC Study Reports describe in detail the specifics of each study, focusing primarily on studies that provide the best evidence of effects (randomized controlled trials). Systematic reviews of the evidence will be conducted to summarize the results of the individual studies.

See the WWC [Detailed Study Report \(PDF\)](#) for more information about this study.

**Topic:** Curriculum-Based Interventions for Increasing K-12 Math Achievement—Middle School

**Intervention:** Saxon Math (*Saxon Algebra 1/2*)

**Research Design:** Quasi-Experimental Design with Stratified Matching

**Study Rating:** 

**Date Released:** March 4, 2005

**Summary of Results:** Crawford and Raia (1986) found that students in the intervention group scored significantly higher than students in the comparison group on math computation, but not on total math or math concepts. Since the analysis was done at the student level while the intervention assignment was at the classroom level, caution should be used in interpreting the results.



= Meets Evidence Standards



= Meets Evidence Standards with Reservations



= Does Not Meet Evidence Standards

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## What Is This Report About?

This WWC report reviews a study of the effects of *Saxon Algebra 1/2* on the mathematics achievement of 8th-grade students and a comparison of textbook content between the intervention and comparison curricula (Crawford & Raia, 1986). Crawford and Raia conducted three analyses with different subsets of the overall sample, but only one analysis is reviewed in this study report. In this matched sample, math achievement of 8th-grade students participating in the *Saxon Algebra 1/2* (intervention) classrooms was compared to math achievement of 8th-grade students participating in Scott-Foresman Mathematics (comparison) classrooms.

This report summarizes the study and reviews its strengths and weaknesses.

## How Was the Study Conducted?

Crawford and Raia conducted this study with four teachers from the Oklahoma City Public Schools (OCPS). All four teachers taught both the intervention and comparison curricula. Crawford and Raia selected a sample of students from the intervention and comparison groups that was matched exactly on pretest total math scores for their analyses. At the end of the

intervention, Crawford and Raia administered the California Achievement Test (CAT) total math, math computation, and math concepts to all students. Crawford and Raia (1986) compared posttest scores between groups for the matched sample to determine if the intervention was effective.

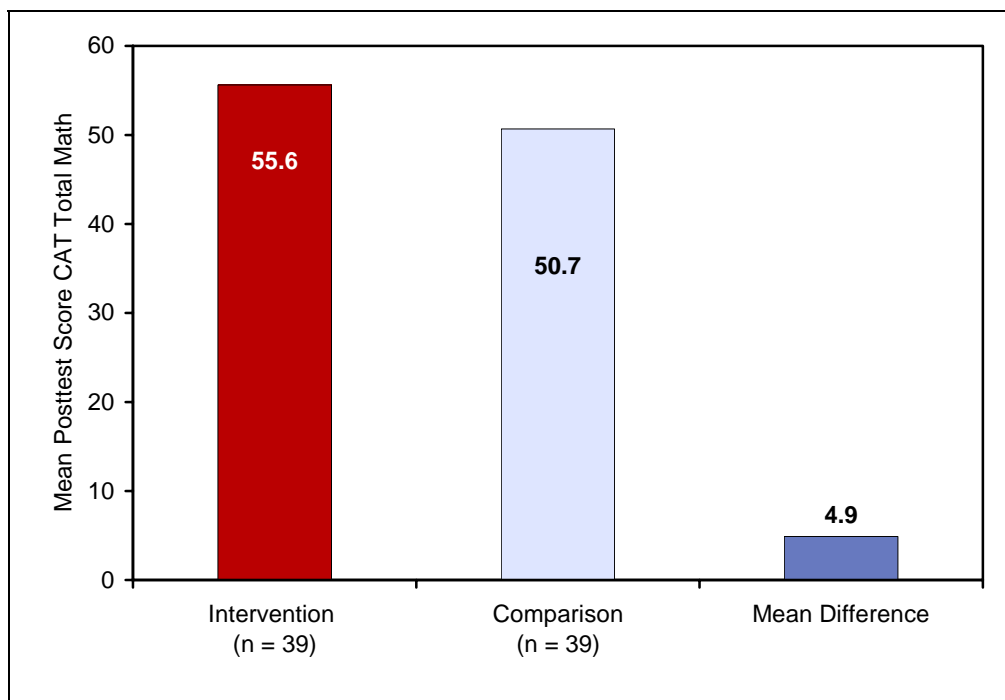
Students in the intervention group participated in *Saxon Algebra 1/2*. Students in the comparison group participated in Scott-Foresman Mathematics. The intervention was piloted during the 1984-1985 academic year.

## What Did the Study Find?

The WWC only reviewed the evidence related to the total math, math computation, and math concepts posttest scores of the intervention and comparison groups. The analysis (see Figures 1a–c) showed that students in the intervention group scored significantly higher than students in the comparison group on math computation, but not on total math or math concepts.

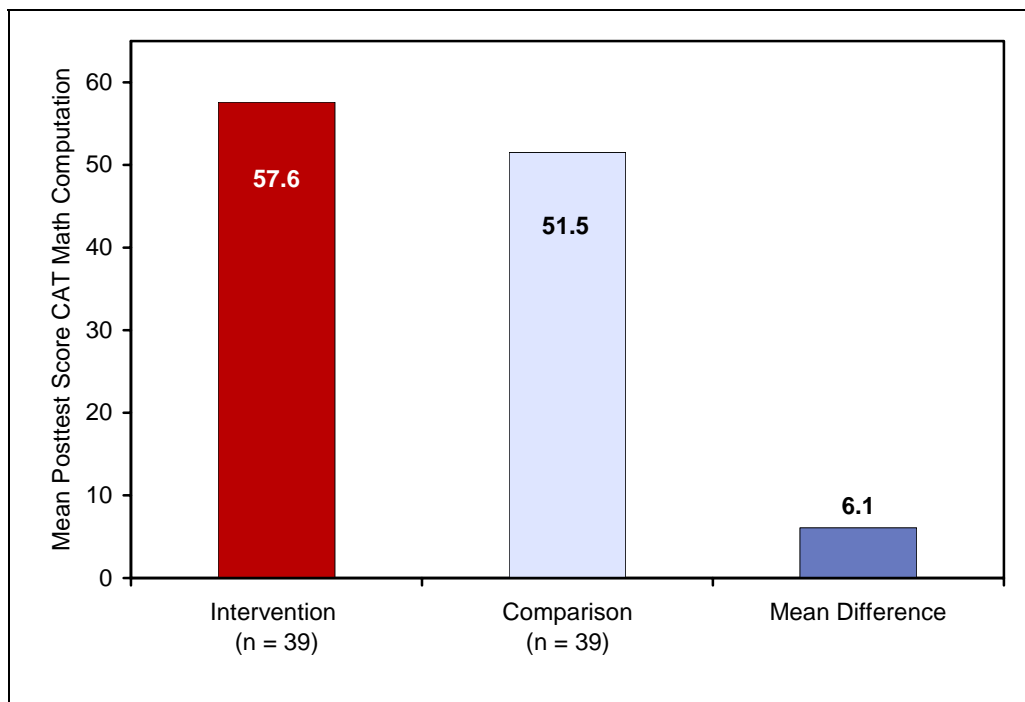
The sample size for this study's matched sample was small, making inferences problematic. Since the analysis was done at the student level while the intervention assignment was done at the classroom level, caution should be used in interpreting the results.

**Figure 1a. Impact Calculated by Crawford and Raia (1986): CAT Total Math Posttest Scores**



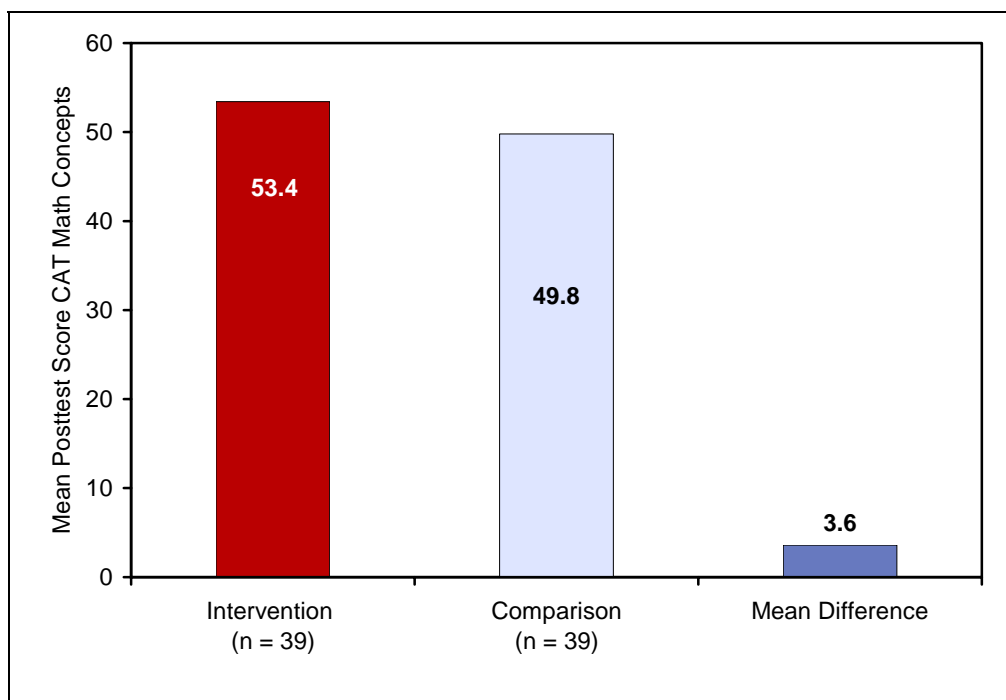
*Note.* The analyses are done at the level of the student, which does not match the unit of assignment (class). Crawford and Raia (1986) reported that the intervention group posttest scores did not differ significantly from the comparison group posttest scores ( $p = ns$ ). CAT = California Achievement Test.

**Figure 1b. Impact Calculated by Crawford and Raia (1986): CAT Math Computation Posttest Scores**



*Note.* The analyses are done at the level of the student, which does not match the unit of assignment (class). Crawford and Raia (1986) reported that the intervention group posttest scores were significantly higher than the comparison group posttest scores ( $p = .05$ ). CAT = California Achievement Test.

**Figure 1c. Impact Calculated by Crawford and Raia (1986): CAT Math Concepts Posttest Scores**



*Note.* The analyses are done at the level of the student, which does not match the unit of assignment (class). Crawford and Raia (1986) reported that the intervention group scores did not differ significantly from the comparison group scores ( $p = ns$ ). CAT = California Achievement Test.

## How Can You Find Out More?

- **To learn more about this study**, read the [detailed report \(PDF\)](#).
- **See reports on** [other studies of Saxon Math](#).
- **Cost information:** not reported for this study, but extensive cost information available at [www.saxonpublishers.com](http://www.saxonpublishers.com).
- **Intervention Developer Contact:**

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## Report Production

**Date created:** March 4, 2005

**Topic area reviewed under:** Curriculum-Based Interventions for Increasing K-12 Math Achievement—Middle School

## WWC Study Ratings<sup>a</sup>: Crawford and Raia (1986)

### Causal Validity: Meets WWC Evidence Standards, a Quasi-Experimental Design with Stratified Matching

Students in the intervention group (*Saxon Algebra 1/2*) were compared to students in the comparison group (Scott-Foresman Mathematics). It is not clear how teachers and students were identified for the study or how they were placed in groups. This study report focuses on the matched sample within the third of three studies. Crawford and Raia (1986) matched the students on pretest California Achievement Test (CAT) total math scores and compared posttest total math, math computation, and math concepts scores between groups. It does not appear that any teachers or students left the study. Crawford and Raia do not report any extraneous events that might have confounded the intervention's effects.

| Other Study Characteristics  | Study Rating | Study-Specific Information   |
|------------------------------|--------------|--|
| Intervention Fidelity        | ●            | <i>Saxon Math</i> meets the definition of Middle School Math. Crawford and Raia do not provide information about the implementation of the <i>Saxon Math</i> program. There does not appear to be a measure of teacher implementation, and teacher training was not discussed.           |
| Outcome Measures             | ●●           | One achievement measure was reported in the study, the CAT, which is a nationally normed, standardized test, has acceptable reliability and validity, and appears to align to the intervention.  |
| People, Settings, and Timing | ●            | The study included a relevant middle school math sample but it was homogeneous with respect to students and settings. The study included only one type of achievement outcome measure, but it was implemented at a time appropriate to capture the effect of the intervention.           |
| Testing within Subgroups     | ●            | The effect of <i>Saxon Algebra 1/2</i> on students' mathematics achievement was tested across the entire matched sample, but was not tested within subgroups of the sample or variations across settings.  |
| Analysis                     | ●            | The unit of assignment (class) was not the same as the unit of analysis (student). The sample sizes were small for the matched sample in this study, making inferences problematic.  |
| Statistical Reporting        | ●●           | Crawford and Raia report unadjusted means and standard deviations at the student level. Effect sizes for the outcome measure could be calculated using a standard formula if means and standard deviations were reported at the level of the class for the matched sample in this study. |

Note. ●● Fully meets criteria; ● Meets minimum criteria; ✕ Does not meet criteria.

<sup>a</sup> For more information on the criteria used to rate this study, see the WWC Evidence Standards: [Middle-School Math](#).